WORLD CROPS

VOLUME 7, 1955

INDEX

LEONARD HILL LIMITED · STRATFORD HOUSE
9 EDEN STREET · LONDON · N.W.1

WORLD CROPS INDEX

Forestry
SD
1
W93
vol 7
1955

VOL. 7 • 1955

A

Abyan Scheme (*ed*) . . . 89
in the Aden Protectorate, The . 105
Aden Protectorate, the Abyan Scheme in 105
Adriatic, Italy reclaims land from . 407
Advances in Agronomy (*br*) . . 169
in Genetics (*br*) . . . 39
Aerial Photography Requirements for Soil Survey Field Operations, *by C. L. W. Swanson* . . . 193
Spraying 307
Afforestation 353
Africa, tobacco production in (*wcr*) . 131
African agriculture, plan for (*ed*) . 381
locust situation 246
Agrarian Reform in West Bengal since Independence, *by T. C. Roy*, M.SC., D.PHIL., A:I.A.R.I. . . 263
Agricultural ' air-tractor ' (*fm*) . 129
Census for England and Wales (*ed*) 381
Conference, English . . . 77
education in the U.S.A. (*ed*) . 300
Engineers' Association . . 333
labour, Indian (*ed*) . . . 218
machinery, developments in . 385
show, the 35th Brussels . 214
News from Eire . . . 30
policy, Switzerland (*wcr*) . . 216
production in 1954, world . . 5
in Africa 7
in Far East 7
in Latin America . . . 7
in Near East 7
in North America . . . 6
in Oceania 7
in Western Europe . . 6
progress in Canada, *by C. H. Goulden*
Part I 427
Part II 493
report, England and Wales (*wcr*) 45, 88, 132, 174, 216, 258, 296, 338, 380, 422, 508
research, European co-operation in 186
Revolution in Turkey, *by P. A. Oram*, M.A., DIP.AGRIC.(CANTAB.), *and D. K. Jones*, M.SC.(WALES)
Part I 137
Part II 278
science in the U.S.S.R. (*ed*) . 47
zoning in U.S.A. . . . 448
Agriculture, antibiotics for . . 492
in Chile 500
in Denmark 483
in the Netherlands (*ed*) . . 133
in the Soviet Union, *by W. G. Cass*
Part I 198
Part II 243
(*corr*) 375
in Tangier 126
in Yugoslavia 469
Agronomic Value and Production of TVA Fertilisers, *by D. W. Thorne and L. F. Seatz* . . . 159
Agronomy, advances in (*br*) . . 169
' Air-tractor ' (*fm*) . . . 129
American farming, developments in tools powered by British tractors on Pacific coast 415
Amos Memorial Lecture, 7th (*res dev*) 81
Angola, sisal production in (*wcr*) . 295
Animal Breeding (*br*) . . . 209

Editorial Comment (*ed*); Research Developments (*res dev*); New Books (*br*); World Crop Reports (*wcr*); Correspondence (*corr*); Farm Machinery (*fm*)

Antibiotic seed disinfection (*ed*) . 339
Antibiotics for agriculture . . 492
Apple and pear crop in New Zealand (*wcr*) 296
cider, growing in the United Kingdom 226
Application of Hand-Controlled Tractors in Under - Developed Areas, *by F. P. D. Moore* . . 390
APPU tour (*ed*) . . . 341, 408
Arabian coffee, shade or no shade for 271
Argentina, plough disks for . . 324
Argentine grain prospects (*wcr*) . 216
Arid and semi-arid lands, grazing resources in 348
lands, tree planting in. . . 353
Artificial Drying in Remote Territories and the Fuel Problem, *by J. McCloy* 109
rain-making, Australian research into 285
in England (*ed*) . . . 298
Asia, tobacco production in (*wcr*) . 131
Atomic energy, peaceful uses of . 458
Atoms for agriculture (*ed*) . . 297
Australasia, sulphur responses in . 441
Australia, floods (*ed*) . . . 176
myxomatosis and the rabbit problem in 118
sorghum 82
sugar and rice research . . 82
tea growing in (*ed*) . . . 341
wheat harvest 82
Australian agricultural news 82, 208, 331
research, development in. . 284
farmers, WORLD CROPS entertains (*ed*) 341, 408
Olives, *by E. G. Wilson* . . 33

B

Bag-loading machinery, hydraulic . 396
Bahia, cocoa industry of . . 97
Cocoa Institute . . . 101
Trade Commission . . 101
Baler (*fm*) 378
Barley and oats crops, world (*wcr*) . 215
as an Irrigated Crop in Iraq, *by R. M. Gorrie*, D.SC. . . 238
difficulties in South Africa . . 125
Beans, growing of, in Tanganyika . 23
Bedgebury, the forest plots at. . 123
Beet eelworm in Eire . . . 30
Bengal, West, agrarian reform in, since independence . . . 263
Bermuda Cedar, *by Gordon R. Groves* 343
Borneo rubber cultivation . . 440
Brazil, bean production in (*wcr*) . 422
the cocoa industry of Bahia. . 97
Bread-grain, world production of (*wcr*) 173
Britain, myxomatosis in (*ed*) . . 134
Britain's pilot farms (*ed*) . . 91
British Commonwealth, cotton production in the 61
crop yields, 1954 (*ed*) . . 177
farm output (*ed*) . . . 220
farming, effect of myxomatosis on 500
Grassland Society meeting . . 43
Industries Fair, 1955, farm machinery at (*fm*) . . . 292
scheme for the approval of insecticides, fungicides and herbicides 14
Standard for returnable boxes . 197
tractors power American tools on Pacific coast 415
Weed Control Conference (*ed*) 3, 31
Brussels Agricultural Machinery Show, 35th 214
Bunt control bulletin . . . 121

C

Calcium metaphosphate . . 160
Canada, agricultural progress . 427, 493
red clover seed production (*wcr*) . 88
Canadian agricultural production (*wcr*) 258
price support (*ed*) . . . 259
Cannabis sativa 240
Carp, Culture of, in Rice Fields (*br*). 502
Caterpillar horse-power rating (*fm*) 130
Cawthron Institute, New Zealand, Report for 1953–54 . . . 128
Cedar, the Bermuda . . . 343
Census, agricultural, for England and Wales (*ed*) 381
Central America, sprinkler irrigation in 317
Cereal crops, effect of maleic hydrazide on 182
dual-action seed dressings for . 449
Ceylon coconut-seed garden (*ed*) . 260
Exhibition 499
Indian paddy machinery in. . 168
(*corr*) 287
irrigation in (*ed*) . . . 383
Chelsea Show, 1955 . . . 277
Chemurgy (*ed*) 133
Chile, agriculture in . . . 500
onions in (*wcr*) 296
Radiata pine in 361
Chlorosis, iron (*ed*) . . . 48
Chopper, straw (*fm*) . . . 504
Cider-Apple Growing in the United Kingdom, *by E. R. Webber* . . 226
Citrus Cultivation in South Africa, *by C. J. Naude* 75
Industry for Zanzibar, *by G. E. Tidbury* 184
juices, refrigerated store for. . 249
Cloche, ' open book ' (*fm*) . . 377
Clover, red, variety trials of . . 183
Cocoa (*br*) 335
future for (*ed*) 467
in New Guinea 444
Industry of Bahia in Brazil, The, *by D. H. Urquhart*, B.SC.(AGRIC.), *and G. A. Ross Wood*, B.A., D.T.A. 97
supplies (*ed*) 89
West African Institute appointment 77
world production of 9, (*wcr*) 173, (*wcr*) 295
Coconut Industry in Portuguese East Africa, *by R. Child*, B.SC., PH.D., F.R.I.C. 488
-seed garden, Ceylon (*ed*) . . 260
Coffee and endrin . . . 156
Arabian, shade or no shade for . 270
-drying experiments . . . 492

in New Guinea 444
industry in Jamaica . . . 496
world production of . . . 9
Cohesion theory (*res dev*) . . 81
Cola, production of, in West Africa. 221
College of Aeronautical and Automobile Engineering . . . 456
Colonial development (*ed*) . . 382
and Welfare Act, 1955 (*ed*) . 260
spraying pool 104
territories, mechanisation of farming in 393
Colorado beetle 430
Combine harvesting and drying . 77
Comfrey, Russian 313
Commission pour l'Exploration de la Mer Méditerranée (*br*) . . 502
Commonwealth crop yields (*ed*) . 339
Compound Milling and Associated Subjects (*br*) 209
Conveying of grain 477
Conveyor, auger (*fm*) . . . 462
pneumatic grain (*fm*) . . 336
Copra curing in Portuguese East Africa 491
Cork oak and endrin 156
Corn, mutations in 459
trade requirements . . . 77
Correspondence to the Editor 79, 287, 375
Costa Rica, the question of shade for coffee in 273
Cottages, farm, painting of (*ed*) . 425
Cotton and endrin 154
in Morocco and the Tadla Research Station, *by C. H. Brown*, B.SC. . 64
Pakistan (*ed*) 259
Pests in Israel in 1954, *by F. Nitzani and J. Palti* . . 267
Production in the British Commonwealth in 1953 . . . 61
in Kenya Colony . . . 62
in Nigeria 63
in Nyasaland 62
in Sudan . . 61, (*wcr*) 296
in Tanganyika Territory . . 62
in Uganda 62
in West Indies . . . 63
prospects in Egypt (*wcr*) . . 46
systemic insecticides for (*ed*) . 92
world production of . 10, (*wcr*) 215
Cottons and hormones (*ed*) . . 135
Cottonseed production, world (*wcr*). 131
County Agricultural Executive Committees' meeting . . . 35
Crankcase lubricants for tractors, technical developments in . . 397
Credit for agriculture (*ed*) . . 384
Critical Study of World Literature on the Lepidopterous Stalk Borers of Tropical Crops (*br*) . . 39
Crop, Commonwealth, yields (*ed*) . 339
forecasting, methods of (*br*). . 83
growth, reducing (*ed*) . . 4
improvement, radiation genetics for 458
Protection (*br*) 209
yields, British, 1954 (*ed*) . . 177
Cultivation of Pyrethrum on the Nilgiris, *by K. N. Raghavan Nair*
Part I 274
Part II 367
Cyprus development (*ed*) . . 178
fruit preservation in . . . 66

D

Dairy Show, 68th (*ed*) . . . 2
Dairying, A Dictionary of (*br*) . 83
in Sweden 445
Danarm 'Whipper' (*fm*) . . 172
Dates, Libyan 208
Daylight, intensity of (*ed*) . . 383
Denmark, agriculture in . . 483
grain crops in (*wcr*) . . 295
Desert locust (*ed*) 261
Development of Spraying Machinery —Part 3: Development, *by R. J. Courshee*, B.SC. 20
Developments in Australian Agricultural Research, *by John Sidney* . 284
in Danish Agriculture During Post-War Years, *by Sigurd Pedersen*, M.SC. . . . 483
in Motorised Agricultural Machinery, *by E. Harris and W. E. Klinner* 385
in Western German Agriculture, *by Wilhelm Weber* . . . 356
Diammonium phosphate . . 162
Dictionary of Dairying (*br*) . . 83
Dicyclopentadiene . . . 154
Diseases of Fruits and Hops (*br*) . 501
Disinfection, antibiotic seed (*ed*) . 339
Drainer, Mole (*fm*) . . . 213
Ditches, maintenance of . . 457
Drill, combine (*fm*) . . . 504
hammer (*fm*) 293

E

Earthworm estimates (*ed*) . . 298
East Malling Research Station, Annual Report for 1954 . . 417
Members' Day . . . 126
Editorial Comment 1, 47, 89, 133, 175, 217, 259, 297, 339, 381, 423, 465
Egypt, cotton prospects in (*wcr*) . 46
hybrid maize in . . . 166
Egyptian irrigation (*ed*) . . 297
Eire, agricultural news from . . 30
beet eelworm in . . . 30
grain-drying facilities . . 30
non-millable wheat in . . 30
Electric fencing for sheep-folding (*fm*) 129
Employment policy and land amelioration in Holland . . . 268
Endrin, *by L. W. Leyland Cole*, M.SC., B.SC.(AGRIC.), F.R.I.C. . . . 154
Engineering in Agriculture (*br*) . 252
England and Wales, agricultural census (*ed*) 381
agricultural report (*wcr*) 45, 88, 132, 174, 216, 258, 296, 338, 380, 422, 508
English Advisory Committee on Rural Land Use . . . 270
Agricultural Conference . . 77
coastal flooding payments . . 70
Ministry of Agriculture Review . 170
Europe, Forest Policies in (*br*) . 40
maize growing in . . . 93
sugar-beet prospects in (*wcr*) . 46
tobacco production in (*wcr*). . 131
winter wheat (*wcr*) . . . 379
European agricultural programme (*ed*) 383
agriculture in South Rhodesia . 124
co-operation in agricultural research 186
Evaporation from water storage (*ed*). 342
Evolution of Tillage Implements, *by N. L. Goodland* . . . 201
Excessive Cultivation Can Reduce Grape Yields, *by C. G. Forshey* . 326
Experimental mulching machine (*fm*) 85
Exports Vital to New Zealand's Forest Industries, *by R. E. Murray* 195

F

FAO, plan for food surpluses (*ed*) . 341
'Farm as a Business' (*ed*) . . 135
guarantees (*ed*) 175
machinery 44, 85, 128, 171, 212, 255, 292, 336, 377, 419, 504
merger 194
prices (*ed*) 90
Farmers' leaflets 197
Farming, mechanisation of, in the Colonial territories . . . 393
methods, U.S. (*ed*) . . . 384
Farms, experimental, in Canada . 430
Fats, oils and oilseeds, world production of 8
Feeding the Fifty Million (*br*). . 416
Fertiliser, activated sludge as. . 435
drill (*fm*) 462
economics (*ed*) 299
granulation (*ed*) . . . 175
requirements of the Kenya Highlands 41
use in U.S.A. (*ed*) . . . 219
Fertilisers 16
declaration of (*ed*) . . . 465
farmers' use of (*ed*) . . . 424
manures or (*ed*) . . . 423
phosphorus, for plantation crops . 431
TVA, production and agronomic value 159
use on coconuts in Portuguese East Africa 490
Fertilising process, new, for improvement of unproductive soil . . 438
Fibres, world production of . . 10
Field chopper (*fm*) . . . 130
Film, Shell 499
Fire-fighting, wet water for (*fm*) . 461
Fish Culture in Conjunction with Rice Cultivation, *by W. H. Schuster*
Part I 11
Part II 67
Fisons Pest Control Ltd. . . . 126
Flaxseed production in Europe (*wcr*) 45
in North America (*wcr*) . . 45
in South America (*wcr*) . . 45
world (*wcr*) 45
Flaying and Curing of Hides and Skins as a Rural Industry (*br*) . 416
Flooding (*ed*) 136
payments, English coastal . . 70
Fluoroacetamide . . . 246, 480
Fluoroacetanilide . . . 246, 480
Foliar plant feeding (*ed*) . . 49
Food and Agriculture in Britain, 1939–45 (*br*) 334
surpluses, FAO plan for (*ed*) . 341
Ford-Ransomes agreement (*fm*) . 44
Forest industries, exports vital to New Zealand's 195
Plots at Bedgebury, *by J. D. U. Ward* 123
Policies in Europe (*br*) . . 40
products (*br*) 84
Statistics—FAO . . . 128
trees and endrin . . . 156
Forestry (*ed*) 240
Congress, Fourth World . . 251
Research in (*br*) . . . 84
tropical 51
wastes (*ed*) 133
work, trailing rotavator for (*fm*) . 255
France, cultivation of topinambur in. 376
grain harvest in. . . . 114
wheat surplus in (*ed*) . . 426
French West Africa, peanuts in (*wcr*) 379
Fruit Annual, 1954–55 (*br*) . . 169
developments in South Africa . 207
growing in South Africa . . 125
Nutrition (*br*) 170
preservation in Cyprus . . 66
soft, effect of maleic hydrazide on 182
trees, genetic changes in . . 459
Pruning of (*br*) . . . 84
Fruits, Diseases of (*br*) . . . 501
Fuel problem and artificial drying in remote territories . . . 109
Full-employment policy and land amelioration in Holland . . 268
Fundamentals of Irrigation, *by A. W. Riddolls*, B.ECON., B.SC., A.M.I. MECH.E., M.I.B.A.E. . . . 301
Fungicides, British scheme for the approval of 14
Future for Oil-Based Sprays? *by E. J. Bals and G. J. Rose* . . . 231

G

Geigy foundation date . . . 120
General Fisheries Council for the Mediterranean, Proceedings and Technical Papers (*br*) . . 502
Irrigation Equipment, *by C. S. Wright* 309
Genetics, Advances in (*br*) . . 39
plant (*ed*) 178
Germany, cultivation of topinambur in 376
Western, agriculture in . . 356
Gezira Scheme, weeds of . . 43
Sudan, spraying techniques and machinery in . . 306, 404
Glasshouses (*ed*) 135
Grain, coarse, harvest . . . 114
conveying 477
crop, Russian (*ed*) . . . 382
Crops (*br*) 501
in Denmark (*wcr*) . . . 295
drier installation, Lincoln Mark II (*fm*) 85
-drying facilities in Eire . . 30
harvest in France . . . 114
in Greece 114
in Portugal 114
in Spain 114
in Turkey 114
in Yugoslavia . . . 114
prospects, Argentine (*wcr*) . 216
storage 78
bins (*fm*) 378
in Tropical Climates, *by T. A. Oxley* 473
silos (*fm*) 420
Grains, world production of coarse . 8
Granadin seed dressing . . . 162
Granulation, fertiliser (*ed*) . . 175
Grape yields, excessive cultivation . 326
Grass exchange (*ed*) . . . 426
Grasses and grasslands, FAO . 347
effect of maleic hydrazide on . 180
Grassland Society, meeting of the . 43
utilisation of (*ed*) . . . 425
Grazing Resources of Arid and Semi-Arid Lands, *by R. O. Whyte* . 348
Grease gun (*fm*) 293
Greece, grain harvest in . . . 114
Growing of Canning Beans in Tanganyika, *by J. K. Robertson* . 23
Growth inhibitor, maleic hydrazide as 179
Guano, pigeon, in Iran . . . 102

H

Hand-controlled tractors, application in under-developed areas . . 390
Hands Across the Ocean . . 408
Hardwoods 123
Hares, myxomatosis in . . . 319
Haricot beans, growing of, in Tanganyika 23
Harrow, spring-tine (*fm*) . . 462
Harvester, sugar-cane (*fm*) . . 377
Hawaiian sugar-cane (*ed*) . . 342
Hemp, Indian 240
Herbicides, British scheme for the approval of 14
Hoe, mid-mounted power (*fm*) . 504
Holland, land amelioration and full-employment policy in. . . 268
Home Grown Threshed Peas Joint Committee Report for 1952–53 . 43
Honduras, coffee in (*wcr*) . . 380
Hormones and cotton (*ed*) . . 135
Hops, diseases of (*br*) . . . 501
Hungary (*wcr*) 421
agricultural programme . . 455
crops in 242
Hurricane Hazel (*ed*) . . . 4
Hutchinson, Dr. J. B., tour . . 22
Hybrid maize 18
in Egypt 166
tests in European and Mediterranean countries . . 42
Hydraulic bag-loading machinery . 396
platform (*fm*) 292
Hydroponics, potentialities of . 56

I

I.B.A.E. scholarships . . . 121
Improvement of the West African Natural Palm Groves, *by C. W. S. Hartley*, M.A., DIP.AGRIC.SCI.(CANTAB.), A.I.C.T.A. . . . 143
Increase of Rice Cultivation in Spain, *by Francisco Jimenez-Cuende* . 401
Incrossbreeding, who invented (*corr*) 79
India, cultivation of pyrethrum in the Nilgiris District . . . 274
floods in (*ed*) 465
irrigation in (*ed*) . . . 136
soilless cultivation of vegetables in 56
Indian agricultural labour (*ed*) . 218
hemp 240
jute inquiry (*ed*) . . . 135
kapok 72
paddy machinery in Ceylon . 168 (*corr*) 287
Indonesia, kapok in 71
sugar production . . . 163
Insecticide plant in Central America. 40
Insecticides, British scheme for the approval of 14
systemic, for cotton plants (*ed*) . 92
Institute of Commonwealth Studies 270
Intensity of daylight (*ed*) . . 383
International Congress on Documentation of Applied Chemistry . 324
Federation of Agricultural Producers, Eighth General Meeting (*ed*) 424, 466
standardisation of farm tractor and machinery details . . . 165
Iowa visit by Soviet farmers (*ed*) . 218
Iran, British agricultural equipment for 283
pigeon towers and pigeon guano in 102
Iraq, barley as an irrigated crop in . 238
Iron chlorosis (*ed*). 48
Irradiation (*ed*) 90
Irrigation 15
barley as an irrigated crop in Iraq 238
by the Spray-Line System, *by J. S. Stower* 329
Egyptian (*ed*) 297
fundamentals of 301
general equipment . . . 309
in Ceylon (*ed*) 383
in India (*ed*) 136
pump (*fm*) 213
spray 115
Sprinkler Systems in Central and South America . . . 317
Israel, citrus in (*wcr*) . . . 421
cotton pests in 1954 . . . 267
vegetables and peanuts in (*wcr*) . 421
Yarkon-Negev pipeline . . 340
Italian agricultural difficulties (*ed*) . 298
Italy reclaims land from Adriatic . 407

J

Jamaica, mechanisation of coffee industry 496
Jet agitator nozzle (*fm*) . . 256
Jute, Indian inquiry (*ed*) . . 135
world production of . . . 10

K

Kapok. 121
by A. E. Haarer, F.L.S. . . 71
in India 72
in Indonesia 71
Karmex W 503
Kenya, cotton production in . . 62
fertiliser requirements in . . 41
Kola Nut of West Africa, *by T. A. Russell* 221

L

Labour, Indian agricultural (*ed*) . 218
Land Amelioration and Full-Employment Policy in Holland, *by Dr. Ir. F. de Soet* 268
Is What We Make it (*br*) . . 128
Larches 123
Leached-zone-ore fertilisers . . 161
Latin America, Outlook in (*ed*) . 423
Lelydorp Project: A Pilot Scheme for Land Development in Surinam, *by J. H. de Haan and J. A. H. Hendriks* 187
Lepidopterous Stalk Borers of Tropical Crops (*br*) 39
Libyan dates 208
Light, intensity of (*ed*) . . . 383
Lincoln Mark II grain-drier installation (*fm*) 85
Linkage control, pre-set (*fm*) . 420
Loader, grain (*fm*) . . . 256
Loaders, mechanical, transport economies with 498
Locust control (*ed*) . . . 340
situation in Africa . . . 246
the desert (*ed*) 261
Locusts, activity in Pakistan . . 459
Long Ashton Research Station Annual Report for 1953 . . 41
Lubricants, technical developments in crankcase, for tractors 397, 453
Lucerne seed production in the U.S.A. 149
Lysenko, T. D. 243

M

Machinery and equipment 44, 85, 128, 171, 212, 255, 292, 336, 377, 419, 504
and tractor details, standardisation of. 165
merger 194
motorised agricultural, developments in 385
Mail order tea cuttings (*ed*) . . 261
Maize cultivation, problems involved in the extension into northern temperate regions . . . 93
for forage and ensilage . . 96
growing in Europe . . . 93
hybrid 18
in Egypt 166
production in the United States (*wcr*) 132
storage in South Africa . . 207
Major developments in American farming 286
'Malastan' 333
Malayan rubber mission (*ed*) . . 1
Maleic Hydrazide as a Plant-Growth Inhibitor, *by E. R. Webber* . . 179
Malt turner (*fm*) 86
Management for milk . . . 122
Manures or fertilisers (*ed*) . . 423
Mauritius Sugar Industry Research Institute (*corr*) 79
Means of Increasing Rice Production (*br*) 127
Mechanical recorders for farm machinery (*fm*) 212
Mechanisation of Farming in the Colonial Territories, *by J. E. Mayne* 393
Mediterranean, olive-oil production (*wcr*) 174
Methods of Crop Forecasting (*br*) . 83
Milk, management for . . . 122
production, progress in (*br*). . 170
Mineral deficiencies, Australian research into 285
Ministry of Agricultural Review, English 170

Mole drainer (*fm*) . . . 213
Morocco, cotton in . . . 64
progress in 214
Moscow Exhibition, 1954 . . 198
Motorised agricultural machinery, developments in . . . 385
Mulching machine, experimental (*fm*) 85
Multi-wire reeler (*fm*) . . . 337
Mushrooms, activated sludge for . 437
Myxomatosis 186
and the rabbit problem in Australia 118
in Britain (*ed*) . . . 134, 500
in hares 319

N

NIAB Crop Conference . . 120
recommended lists . . . 225
National Forest Policies in Europe (*br*) 40
Nicotiana, The Genus (*br*) . . 460
Nyasaland and Rhodesia, tobacco in (*wcr*) 421
Nematodes threaten world food supply (*ed*) 217
Netherlands, agriculture in . . 133
Nevada dam 312
New appointments . . 192, 414
books 39, 83, 127, 169, 209, 252, 288, 334, 416, 501
Guinea, coffee and cocoa . . 444
Trends in Lucerne Seed Production in the United States, *by Dr. C. de Fellner* 149
(*Erratum*) 214
vitamin-C crop (*ed*) . . . 92
Year Honours 70
Zealand, apple and pear crop in (*wcr*) 296
irrigation in 301
paper industry (*ed*) . . 176
Zealand's forest industries, exports vital to 195
Nicaragua, insecticide plant in . 40
Nigeria, cotton production in . 63
oilseed processing in . . . 42
Nilgiris, cultivation of pyrethrum on 274, 367
Nitric phosphates . . . 161
Norfolk, problem area in . . 36
North America, leaf tobacco production in (*wcr*) 131
Northern Rhodesia, scotch carts in . 148
Nozzle, jet agitator (*fm*) . . 256
'Nubrex' lubricator (*fm*) . . 85
Nyasaland, cotton production in . 62
phosphate deposit . . . 459

O

Oats and barley crops, world (*wcr*) . 215
Oceania, tobacco production in (*wcr*) 131
Oil based sprays 231
palm, improvement of the West African natural . . . 143
Oilseed Processing in Nigeria . 42
Olive-oil production in the Mediterranean area (*wcr*) . . . 174
Olives, Australian . . . 33
Onions in Chile (*wcr*) . . . 296
Orchard crop and endrin . . 156
Osmotic pressure (*res dev*) . . 81
Output, British farm . . . 220

P

Packman potato harvester (*fm*) . 85
Paddy machinery, Indian, in Ceylon 168, (*corr*) 287
Pakistan, agricultural aid . . 457
cotton (*ed*) 259
floods in (*ed*) 465
sugar-cane (*wcr*) . . . 380
Palm groves, the improvement of West African 143
Pan-American Agricultural Science Congress 414
Paper industry, New Zealand (*ed*) . 176
pulp *v.* weeds (*ed*) . . . 49
Pear and apple crop in New Zealand (*wcr*) 296
Peanuts, genetic changes . . 459
Peas, committee report . . . 43
Peppermint oil prospects in South Africa 125
Pest infestation research (*ed*) . . 300
Pesticides Group of the Society of Chemical Industry (*ed*) . . 1
Phosphate deposit in Nyasaland . 459
Phosphorus Fertilisers for Plantation Crops, *by D. J. Halliday and J. B. Sylvester* 431
Photography, aerial requirements for soil survey field operations . . 193
Phytosanitary certificates (*ed*) . . 48
Pigeon Towers and Pigeon Guano in Iran, *by Dr. M. L. Dewan* . . 102
Pilot farms, British (*ed*) . . 91
Pine, Radiata, in Chile . . . 361
Plant breeding 16
Climate and Irrigation (*br*) . . 210
feeding, foliar (*ed*) . . . 49
food, activated sludge as . . 436
genetics (*ed*) 178
growth and water (*res dev*) . . 81
inhibitor, maleic hydrazide as . 179
substances . . . 407
Protection, Practical (*br*) . . 460
Plantation Crops (*br*) . . . 252
phosphorus fertilisers for. . 431
Plants, uptake of phosphorus . . 433
Plasmolysis (*res dev*) . . . 81
Plastic tubing for cold liquids. . 232
Plough disks for Argentina . . 324
universal headland (*fm*) . . 504
Poland, developments in . . 414
Portugal, grain harvest in . . 114
Portuguese East Africa, coconut industry in 488
Possibilities of Increasing World Food Supplies, The: II, *by W. H. Pawley* 15
Potassium metaphosphate . . 161
Potato harvester, Packman (*fm*) . 85
Power dusting machine (*fm*) . . 336
Powling process . . . 390, 500
Pre-emergence weedkiller . . 158
Pre-set linkage control (*fm*) . . 420
Price support, Canadian (*ed*) . . 259
Problem area in Norfolk . . 36
Problems Involved in the Extension of Maize Cultivation into Northern Temperate Regions, *by J. L. Harper*, D.PHIL. 93
Proceedings of the Second British Weed Control Conference, 1954 (*br*) 288
Progress in Milk Production (*br*) . 170
Protection of Timber, *by J. N. Hope* 370
Pruning of Fruit Trees (*br*) . . 84
Pump, irrigation (*fm*) . . . 213
kit, all-purpose (*fm*) . . . 337
self-priming water (*fm*) . . 293
Pyrethrum, cultivation of, on the Nilgiris 274, 367

R

R.A.S.E. Gold Medal, 1955 . . 237
Research Medal . . . 259
Rabbit problem and myxomatosis in Australia 118
Radiata Pine in Chile, *by C. W. Scott* 361
Rain-making, artificial, Australian research into 285
in England (*ed*) . . . 298
Ransomes-Ford agreement (*fm*) . 44
Reaper, Albion '12SD' (*fm*) . 419
Reclamation, Italy reclaims land from Adriatic 407
Recorders, mechanical, for farm machinery (*fm*) 212
Red-clover-seed production, Canada (*wcr*) 88
Reducing crop growth (*ed*) . . 4
Reeler, multi-wire (*fm*) . . 337
Refrigerated store for citrus juices . 249
Removing salt from sea-water (*ed*) . 384
Report on Cacao Research, 1953 (*br*) 288
'Report on Farming' (*ed*) . . 134
Reports and publications 41, 128, 211, 253, 290, 376, 416, 501
Research, agricultural, European co-operation in 186
developments 81
in Forestry and Forest Products (*br*) 84
Returnable boxes, British Standard for 197
Rhinoceros beetle in South Pacific . 440
Rhodesia and Nyasaland, tobacco in (*wcr*) 421
Rice and endrin 156
and sugar research in Australia . 82
conference recommendations . 35
cultivation in conjunction with fish culture . . . 11, 67
in Spain 401
Fields, Culture of Carp in (*br*) . 502
in Australia 208
in the Far East 18
international report (*wcr*) . . 422
problem in (*ed*) . . . 177
world production of . 8, (*wcr*) 87
Rock pickers (*fm*). 129
Rooibos tea prospects in South Africa 125
Rotary cultivator (*fm*) . . . 292
Rotavator for forestry work (*fm*) . 255
Rothamsted Experimental Station, Report for 1954. . . . 418
Royal Show, 1955 . . . 371
Rubber cultivation in Borneo . 440
Malayan mission (*ed*) . . 1
substitutes for synthetic . . 91
world production . . . 10
Russia, U.K. agriculturists visit (*ed*) 466
Russian Comfrey — Food for Thought, *by L. D. Hills* . 313
grain crop (*ed*) 382
Rust-resistant wheat . . . 415

S

S.C.I. Agricultural Group . . 333
Pesticides Group (*ed*) . . 1
Salt of the earth (*ed*) . . . 3
removing, from sea-water (*ed*) . 384
'Science in the Tropics' . . 270
Scotch carts in Northern Rhodesia . 148
Scrubcutter (*fm*) 419
Sea-water, removing salt from (*ed*) . 384
Secretary-General of South Pacific Commission 19
Seed dressing, Granadin . . 162
dressings, dual-action, for cereal crops 449
improvement 16
spacing drill (*fm*) . . . 172
Selective weedkillers (*ed*) . . 217
Shade or No Shade for Arabian Coffee, *by A. E. Haarer*, F.L.S. . 271
Sheep folding, electric fencing for (*fm*) 129
spray race (*fm*) . . . 419
Shell Research Company . 55, 124
Silos, grain-storage (*fm*) . . 420
wooden grain storage (*fm*) . . 378
Sisal treatment in Tanganyika . 230
Skips, tractor-mounted (*fm*) 255, (*Corrigendum*) 332
Sludge, activated, use of, as a fertiliser 435

Smithfield Show and Agricultural Machinery Exhibition, 1954 26, 74
Sodium (*ed*) 219
fluoroacetate, preparation and uses of 480
Soil analysis (*ed*) 468
conservation in Canada . . 495
fertility 15
particles 247
steriliser, small-scale (*fm*) . . 336
survey field operations, aerial photograph requirements for . 193
unproductive, fertilising process for improvement of . . 438
Soils in Portuguese East Africa . 488
Irrigated: Their Fertility and Management (*br*) . . . 460
Soilless Cultivation of Vegetables in India, *by J. W. E. Sholto Douglas*, B.SC., DIP.AGRIC. 56
Some Aspects of Indian Hemp, *by R. D. Chandler* 240
Sorghum in Australia . . . 82
South Africa (*wcr*) . . . 379
barley difficulties in . . 125
canning factory negotiations . 38
citrus cultivation in . . . 75
exports 38
fruit growing in . . . 125
hybrid maize . . . 38
maize exports . . . 38
peppermint oil prospects in . 125
rooibos tea prospects in . . 125
tobacco crop in . . . 125
African agricultural developments 38, 125, 207, 250, 332
America, tobacco production in (*wcr*) 131
sprinkler irrigation in . . 317
Pacific Commission, Rockefeller grant 440
Secretary-General . . 19
Southern Rhodesia, European agriculture in 124
plan for agriculture (*ed*) . . 381
Soviet farmers visit Iowa (*ed*) . 218
Union, agriculture in 198, 243, (*corr*) 375
Soya beans, world production of (*wcr*) 295
Spain, grain harvest in . . . 114
increase of rice cultivation in . 401
Spray Irrigation, *by T. K. Cordes* . 115
Sprayer, low/medium-volume (*fm*) . 256
tanks (*ed*) 299
Spraying machinery (*ed*) . . 426
development of . . . 20
nozzles, testing in the field (*corr*) . 79
pool, colonial 104
Techniques and Machinery in the Sudan Gezira, *by A. M. Toms*, N.D.A.
Part I 306
Part II 404
Sprays, oil-based 231
Spreader, 3-ton (*fm*) . . . 213
Sprex 158
Spruces 123
Steriliser, small-scale soil (*fm*) . 336
Storage bins, wooden grain (*fm*) . 378
of grain in tropical climates. . 473
Straw chopper (*fm*) . . . 504
Sudan, cotton production in 61, (*wcr*) 296
Gezira, spraying techniques and machinery in . . . 306, 404
Sugar and rice research in Australia. 82
-beet prospects in Europe (*wcr*) . 46
-cane and endrin . . . 155
harvester (*fm*) . . . 377
Hawaiian (*ed*) . . . 342
industry research, Mauritius (*corr*) 79
international report (*wcr*) . . 338
Production in Indonesia, *by John Grindrod*, B.A.(COM.) . . 163
world production of . 8, (*wcr*) 88
Sulphur Responses in Australasia, *by T. W. Walker*, A.R.C.S., B.SC., D.I.C., PH.D. 441
Surinam, the Lelydorp project, a pilot scheme for land development 187
Surplus programmes (*ed*) . . 220
Surpluses, food, FAO plan for (*ed*) . 341
Survey of the Agriculture of Kent (*br*) 210
Sweden—A Dairying Country, *by Richard Hakansson* . . . 445
Swedish Agriculture Today, *by M. Gordon* 410
'Swingfog', new unit (*fm*) . . 171
Switzerland, agricultural policy (*wcr*) 216
Synthetic rubber substitutes (*ed*) . 91
Systemic insecticides for cotton plants (*ed*) 92

T

TVA fertilisers, production and agronomic value . . . 159
Tadla Research Station . . . 64
Tanganyika Agricultural Corporation 335
cotton production in . . . 62
growing of canning beans in . 23
sisal treatment in . . . 230
Tea cuttings, mail order (*ed*) . . 261
growing in Australia (*ed*) . . 341
prices (*ed*) 47
production (*ed*) 382
general (*wcr*) . . . 257
Research Institute of East Africa, conference proceedings . 43
rooibos prospects in South Africa 125
world production of . . . 9
Technical Developments in Crankcase Lubricants for Tractors, *by E. S. Bates*, A.M.I.MECH.E., M.I.B.A.E. 397
Telescopic lifter (*fm*) . . . 292
Tempany, Sir Harold (*ed*) 153, 297, 324, 360
Terminology (*ed*) 465
Testing of spraying nozzles in the field (*corr*) 79
Tillage Implements (*br*) . . 288
the evolution of
Part I 201
Part II 233
Timber, protection of . . . 370
Tobacco and endrin . . . 155
crop in South Africa . . . 125
effect of maleic hydrazide on . 182
in Canada. 494
production in Africa (*wcr*) . . 131
in Asia (*wcr*) 131
in Europe (*wcr*) . . . 131
in North America (*wcr*) . . 131
in Oceania (*wcr*) . . . 131
in South America (*wcr*) . . 131
world production of . . . 10
Tomato Growing (*br*) . . . 83
Topinambur in France and Germany 376
Tractor, 'Farmers' Boy' (*fm*) . 294
and machinery details, standardisation of 165
tipping trailer (*fm*) . . . 294
Tractors, application of hand-controlled, in under-developed areas 390
British, power American tools on Pacific coast 415
crankcase lubricants . . . 453
developments in crankcase lubricants 397
Trailer, three-ton tipping tractor (*fm*) 294
'Traxcavator' (*fm*) . . . 461
Tree Planting in Arid Areas, *by Eric Ford* 353
Trees, world festival of . . . 42
Trench excavator (*fm*) . . . 292
Tricalcium phosphate, fused . . 159
Tropical forestry 51
Tropics, storage of grain in . . 473
Tubing, plastic, for cold liquids . 232
Tunisia, grain crops in (*wcr*) . . 380
Turkey, agricultural revolution in 137, 278
grain harvest in . . . 114
Two Acres Unlimited (*br*) . . 127

U

U.S. farming methods (*ed*) . . 384
fertiliser use (*ed*) . . . 219
U.S.A., agricultural education in (*ed*) 300
lucerne seed production in . . 149
maize in (*wcr*) . . . 132, 380
U.S.S.R., agricultural science in (*ed*) 47
agriculture in . . . 198, 243
Uganda, cotton production in . 62
Under-developed areas, application of hand-controlled tractors in . 390
United Kingdom, cider-apple growing in 226
Unyamwezi Development Corporation (*ed*) 259
Use of Sprinkler Irrigation Systems in Central and South America, *by Deborah Gilbert* 317

V

Vanadium, more views on (*ed*) . 50
Vegetables, effect of maleic hydrazide on 181
Vegetation and Watershed Management (*br*) 334
Verona Agricultural Fair . . 273
Village-AID Programme (*ed*) . . 262
Villiers Engine for Industrial, Agricultural and Horticultural Use (*br*) 127
Vineyards and wines congress. . 459
Vitamin C, new crop . . . 92
Vygie for wheat crops in South Africa 207

W

Wartime Agriculture in Australia and New Zealand, 1939–50 (*br*) . 289
Water and plant growth (*res dev*) . 81
storages, evaporation from (*ed*) . 342
Watson, Sir James Scott . . 237
Weed control conference, British (*ed*) 3, 31
in Farm and Garden (*br*) . 169
Weedkiller, pre-emergence . . 158
Weedkillers, selective (*ed*) . . 217
Weeds of the Gezira Scheme . 43
v. paper pulp (*ed*) . . . 49
West Africa, the kola nut of . . 221
mechanisation of farming in . 393
African Cocoa Research Institute, Annual Report for the year ended March 1954 . . . 417
Cocoa Research Institute appointment 75
Institute for Oil Palm Research 43, 143
natural palm groves, the improvement of . . . 143
Bengal, agrarian reform since independence 263
Indies, cotton production in . 63
Western German agriculture . . 356
Europe's Grain Harvest, *by Eric Ford* 114
Wheat 18
in Australia . . . 82, 208
non-millable, in Eire . . . 30
rust-resistant 415
surplus in France (*ed*) . . 426
world production of . . . 7
surplus (*ed*) 465
Williams, W. R. 243
Wines, congress 459
Wooden grain-storage bins (*fm*) . 378
World agricultural production in 1954 5
agriculture, recovery of (*ed*) . 468
crop reports 45, 87, 131, 173, 215, 257, 295, 338, 379, 421, 463, 507
crops of oats and barley (*wcr*) . 215
Festival of Trees . . 42
Forestry Congress, Fourth . . 251
production of bread-grain (*wcr*) 173

of coarse grains . . . 8
of cocoa 9, (*wcr*) 173, (*wcr*) 295
of coffee 9
of cotton . . 10, (*wcr*) 215
of cottonseed (*wcr*) . . 131
of fats, oils and oilseeds . . 8
of flaxseed (*wcr*) . . . 45
of hard fibres . . . 10
of jute 10
of rubber 10
of rice . . . 8, (*wcr*) 87
of soya beans (*wcr*) . . 295
of sugar . . 8, (*wcr*) 88
of tea . . . 9, (*wcr*) 257
of tobacco . . 10, (*wcr*) 131
of wheat 7
wheat surplus (*ed*) . . . 465
Wright, S. J. 172

Y

Yearbook of Food and Agricultural Statistics (*br*) 501
Yields, British crop, 1954 (*ed*) . 177
Commonwealth (*ed*) . . . 339
'You *Versus* Pests' Exhibition . 225
Yugoslav Agriculture 1954, *by Dr. C. de Fellner* 469
Agriculture's Ten-Year Plan, *by M. Gordon* 320
Yugoslavia, grain harvest in . . 114

Z

Zanzibar, a citrus industry for. . 184

AUTHOR INDEX

BALS, E. J., and ROSE, G. J.: A Future for Oil-Based Sprays? . 231
BARROW, V. L., B.SC.(AGRIC.), N.D.A., F.R.H.S.: Use of Activated Sludge as a Fertiliser 435
BATES, E. S., A.M.I.MECH.E., M.I.B.A.E.: Technical Developments in Crankcase Lubricants for Tractors
Part I 397
Part II 453
BIRRE, ANDRÉ: A New Fertilising Process for the Improvement of Unproductive Soil 438
BROWN, C. H., B.SC.: Cotton in Morocco and the Tadla Research Station 64
CASS, W. G.: Agriculture in the Soviet Union
Part I 198
Part II 243
CHANDLER, R. D.: Some Aspects of Indian Hemp 240
CHILD, R., B.SC., PH.D., F.R.I.C.: Coconut Industry in Portuguese East Africa, The 488
COLE, L. W. LEYLAND, M.SC., B.SC. (AGRIC.), F.R.I.C.: Endrin . . 154
CORDES, T. K.: Spray Irrigation . 115
COURSHEE, R. J., B.SC.: Development of Spraying Machinery: Part III —Development 20
DE FELLNER, Dr. C.: New Trends in Lucerne Seed Production in the United States . 149
Yugoslav Agriculture 1954 . . 469
DE HAAN, J. H., and HENDRIKS, J. A. H.: The Lelydorp Project: a Pilot Scheme for Land Development in Surinam 187
DE SOET, Dr. F.: Land Amelioration and Full-Employment Policy in Holland 268
DEWAN, Dr. M. L.: Pigeon Towers and Pigeon Guano in Iran . . 102
DOUGLAS, J. W. E. SHOLTO, B.SC., DIP.AGRIC.: The Soilless Cultivation of Vegetables in India . . 56
FORD, E.: Tree Planting in Arid Regions . 353
Western Europe's Grain Harvest. 114
FORSHEY, C. G.: Excessive Cultivation Can Reduce Grape Yields . 326
GILBERT, DEBORAH: The Use of Sprinkler Irrigation Systems in Central and South America. . 317
GOODLAND, N. L.: The Evolution of Tillage Implements
Part I 201
Part II 233
GORDON, M.: Yugoslav Agriculture's Ten-Year Plan 320
Swedish Agriculture Today. . 410
GORRIE, R. MACLAGAN, D.SC.: Barley as an Irrigated Crop in Iraq . 238
GOULDEN, C. H.: Agricultural Progress in Canada
Part I 427
Part II 493
GRINDROD, J., B.A.(COM.): Sugar Production in Indonesia . . 163
GROVES, GORDON R.: The Bermuda Cedar 343
HAARER, A. E., F.L.S.: Kapok 71
Shade or No Shade for Arabian Coffee 271
HÅKANSSON, RICHARD: Sweden—A Dairying Country . . . 445
HALLIDAY, D. J., and SYLVESTER, J. B.: Phosphorus Fertilisers for Plantation Crops . . . 431
HAMPSON, C. P., B.SC.: Dual-Action Seed Dressings for Cereal Crops . 449
HARPER, JOHN L., D.PHIL.: Problems Involved in the Extension of Maize Cultivation into Northern Temperate Regions 93
HARRIS, E., and KLINNER, W. E.: Developments in Motorised Agricultural Machinery . . . 385
HARTLEY, C. W. S., M.A., DIP.AGRIC. SCI.(CANTAB.), A.I.C.T.A.: The Improvement of the West African Natural Palm Groves. . . 143
HENDRIKS, J. A. H.: *See* de Haan, J. H., and Hendriks, J. A. H.
HILLS, L. D.: Russian Comfrey—Food for Thought . . . 313
HOPE, J. N.: Protection of Timber . 370
JIMÉNEZ-CUENDE, F.: The Increase of Rice Cultivation in Spain . 401
JONES, D. K., M.SC.(WALES): *See* Oram, P. A., M.A., DIP.AGRIC. (CANTAB.), and Jones, D. K., M.SC.(WALES)
KLINNER, W. E.: *See* Harris, E., and Klinner, W. E.
MCCLOY, J.: Artificial Drying in Remote Territories and the Fuel Problems 109
MAYNE, J. E.: Mechanisation of Farming in the Colonial Territories 393
MURRAY, R. E.: Exports Vital to New Zealand's Forest Industries . 195
NAIR, K. N. RAGHAVAN: Cultivation of Pyrethrum on the Nilgiris
Part I 274
Part II 367
NAUDE, C. J.: Citrus Cultivation in South Africa 75
NITZANI, E., and PALTI, J.: Cotton Pests in Israel in 1954. . . 267
ORAM, P. A., M.A., DIP.AGRIC. (CANTAB.), and JONES, D. K., M.SC. (WALES): The Agricultural Revolution in Turkey
Part I 137
Part II 278
OXLEY, T. A.: Grain Storage in Tropical Climates . . . 473
PALTI, J.: *See* Nitzani, E., and Palti, J.
PAWLEY, W. H.: Possibilities of Increasing World Food Supplies —II 15
PEDERSEN, SIGURD, M.SC.: Developments in Danish Agriculture During Post-War Years . . 483
PHILLIPS, M. A., D.SC., F.R.I.C., A.M.I.CHEM.E.: The Fluoroacetate Series of Pesticides . . . 480
RIDDOLLS, A. W., B.ECON., B.SC., A.M.I.MECH.E., M.I.B.A.E.: Fundamentals of Irrigation . . . 301
ROBERTSON, J. K.: Growing of Canning Beans in Tanganyika . . 23
ROSE, G. J.: *See* Bals, E. J., and Rose, G. J.
ROY, T. C., M.SC., D.PHIL., A.I.A.R.I.: Agrarian Reform in West Bengal Since Independence 263
RUSSELL, T. A.: The Kola Nut of West Africa 221
SCHUSTER, W. H.: Fish Culture in Conjunction with Rice Cultivation
Part I 11
Part II 67
SCOTT, C. W.: Radiata Pine in Chile 361
SEATZ, L. F.: *See* Thorne, D. W., and Seatz, L. F.
SIDNEY, JOHN: Developments in Australian Agricultural Research . 286
STOWER, J. S.: Irrigation by the Spray-Line System 329

SWANSON, C. L. W.:
Aerial Photography Requirements for Soil Survey Field Operations 193
An Inside Look at the Soil . . 247

SYLVESTER, J. B.: *See* Halliday, D. J., and Sylvester, J. B.

THORNE, D. W., and SEATZ, L. F.:
Agronomic Value and Production of TVA Fertilisers . . . 159

TIDBURY, G. E.: A Citrus Industry for Zanzibar 184

TOMS, A. M., N.D.A.:
Spraying Techniques and Machinery in the Sudan Gezira
Part I 306
Part II 404

URQUHART, D. H., B.SC.(AGRIC.), and WOOD, G. A. ROSS, B.A., D.T.A.:
The Cocoa Industry of Bahia in Brazil 97

WALKER, T. W., A.R.C.S., B.SC., D.I.C., PH.D.: Sulphur Responses in Australasia 441

WARD, J. D. U.: The Forest Plots at Bedgebury 123

WEBBER, E. R.:
Maleic Hydrazide as a Plant Growth Inhibitor . . . 179

Cider-Apple Growing in the United Kingdom 226

WEBER, W.: Developments in Western German Agriculture . . 356

WHYTE, R. A.: Grazing Resources of Arid and Semi-Arid Lands . . 343

WILSON, E. G.: Australian Olives . 33

WOOD, G. A. ROSS, B.A., D.T.A.: *See* Urquhart, D. H., B.SC.(AGRIC.), and Wood, G. A. Ross, B.A., D.T.A.

WRIGHT, C. S.: General Irrigation Equipment 309